Oral Presentation (IS-17)

Diagnosing and Managing of Canine Diabetes Mellitus

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OVERVIEW

High blood glucose level or hyperglycemia is caused by few factors, such as diabetes mellitus, stress-induced hyperglycemia, use of glucocorticoid, or hyperadrenocorticism. Therefore, it is important to have a thorough examination before having diabetes mellitus as a diagnose from hyperglycemia.

Diabetes mellitus happens because of pancreas failure in insulin production that is sufficient to control blood glucose level or insulin failure to decrease blood glucose level because of the insulin resistant. When hyperglycemia happens and over the ability of kidney to absorb glucose then it will appear in the urine (glucosuria). Glucosuria will induce the diuretic-osmotic process that will attract a lot of water to tubulus renalis and induce the clinical sign polyuria. Polyuria will trigger the body to keep hydrated by trigger the thirst center in the brain that cause the clinical sign polydipsia. Insulin is needed by the body to help glucose entering into the cell so it can be used as an energy source. If the insulin level in blood is low then the glucose will fail to enter the cell. This will cause a series of process, the first process is the body will have the energy deficit that trigger the hunger center in the brain to work and cause clinical sign polyphagia. Furthermore, the body will have to break the fat to get energy that can cause weightloss. The use of fat as an energy source continuously will cause high formation of keton bodies that can cause ketoacidosis condition (Ketoacidosis diabetes).

Diabetes mellitus consist of 2 types, type 1 and type 2 of diabetes mellitus. Type 1 of diabetes mellitus happens because of the failure of beta cell in insulin production so it produces a very less insulin or none. Dog is an animal that is common to have this type of diabetes mellitus. While type 2 of diabetes mellitus happens because of the insulin failure to work (insulin resistant) which is related to obesity. High level of body fat will induce the release of cytokine that inhibits insulin work so blood glucose level will arise. If this condition runs in a cronic matter then the beta cell will damage and will fail to produce insulin. Cat is a common animal to have this type 2 of diabetes mellitus.

DIABETES MELLITUS IN DOG

As explains above, dog is common with type 1 of diabetes mellitus. This cause a dog that have this type of diabetes will not have a remission from this condition. Dog's breeds that is predisposition to this diabetes mellitus are australian terrier, schnauzer, samoyed, miniature schnauzer, fox terrier, keeshond, bichon frise, poodle, and husky. While age that is at risk for diabetes mellitus is ranging from 8-15 years old. Small breed dog have a higher risk to have diabetes mellitus than large-giant breed dog. Obesity increase the chance to have diabetes mellitus by 5-8 times. Base on the clinical experience, dog that gets a lot of dog's treats/jerkies that contain high glucose and fat from its owner is the most frequent patient of diabetes mellitus. So it is not recommended to give a lot of that kind of treats to your dog. Dog that is given glucocorticoid in a long term will likely to have a higher risk to get diabetes mellitus, because glucocorticoid induces insulin resistant.

Common clinical signs that generally appears in diabetes mellitus such as polyuria, polydipsia, polyphagia and weightloss. However there is one clinical sign that happens in dog but not in cat and that is cataract. Cataract happens in a diabetic patient that does not get proper dosage of insulin or insulin resisten. Cataract often comes 5-6 months after patient was diagnosed for diabetes mellitus and can only be treated by surgery.

Examination of diabetes mellitus diagnose consist of urine examination, fasting blood glucose test, liver and kidney function. Major clinical findings of diabetes mellitus are glucosuria and hyperglysemia. While another findings ca be increation of ALT, ALP, ureum and/or creatinine and cholesterol.

Treatment of diabetes mellitus in dog is by administration of insulin (0.5-1 iu/kg BB, 30 minutes before feeding). Insulin that can be given to treat diabetes mellitus in dog such as porcinelente, NPH insulin, pro-zinc insulin, and glargine. Only porcinelente and pro-zinc insulin that produce special for veterinary use. The other insulin are human product. Feeding consistent meals at fixed times each day is crucial to successful management of diabetes in dogs. The best diet to be given is low carbohydrat, high fiber,

low protein and low fat diet.

The goal of managing diabetes mellitus in dog is reduction of clinical sign polyuria and polydipsia. While maintaining stable bodyweight and not having weightloss show controlled blood sugar level. Measurement of fructosamine is an additional method for assessing glycemic control. Fructosamine concentration provide approximate measures of average blood glucose concentration over the preceding 2-4 weeks, respectively, and thus are indivators of longer term diabetic control. Some owner are able to perform home serial blood glucose concentration curves. Home generated serial blood glucose curves are as reliable as hospital generated curves, and may provide better information in dogs affected by stress of hospital visits.

Some cases of diabetes mellitus are harder to treat. The majority of uncomplicated diabetic dogs are stabilized on an insulin dose of approximately 0.5u/kg until 1u/kg. If insulin doses exceeding 1.5u/kg insulin resistance should be suspected. Concurrent disease or drug therapy causing insulin resistance are urine tract infection, oral or dental infection, hyperadrenocorticism, hypothyroidism, systemic or topical corticosteroids and pancreatitis. Treating the underlying causes will make insulin sensitivity can be improve. Well controled diabetic dogs have similar chance of survival to that of non-diabetic dogs of the same age and gender, although death is still more frequent during the first 6 month of therapy.